

Claims

What is claimed is:

1. A waste receptacle comprising:
  - a housing having a space defined therein in which a quantity of refuse can be accumulated;
  - an access door mounted to said housing, said access door being movable to an open position to permit refuse to be introduced into the space;
  - an actuator operable to move said access door to said open position;
  - a controller connected to said actuator, said controller governing operation of said actuator;
  - a sensor mounted to detect the presence of patrons adjacent to said access door; said controller being operable to monitor said sensor;
  - said controller being operable to cause said door to open when a patron is sensed adjacent to said door; and
  - an output signal member operatively connected to said controller, said output signal member being operable to convey a message to the patron adjacent to said access door.
2. The waste receptacle of claim 1 wherein said output signal member is a loudspeaker.
3. The waste receptacle of claim 1 wherein said controller is operable to cause said output signal member to emit a message chosen from the set of messages consisting of:
  - (a) a digitally synthesized voice message; and
  - (b) a taped voice message.
4. The waste receptacle of claim 1 wherein said controller is programmable, to permit use of customized messages.
5. The waste receptacle of claim 1 wherein said patron sensor includes a first sensing element and a second sensing element, said first sensing element being oriented to cover a first approach envelope, said second sensing element being oriented to cover a second approach envelope, said first approach envelope being at least partially different from said second approach envelope.

6. The waste receptacle of claim 5 wherein said proximity sensor has a plurality of illumination elements, said plurality of illumination elements being co-operable to cover all of said first approach envelope.

7. The waste receptacle of claim 6 wherein said plurality of illumination elements includes at least a first illumination element oriented to cover at least a first portion of said first approach envelope of said first sensing element, and a second illumination element oriented to cover at least a second portion of said first approach envelope, said first and second illumination elements being co-operable to cover all of said first approach envelope.

8. The waste receptacle of claim 1 further comprising a refuse bin mounted within said housing, said bin being placed to receive refuse introduced through said access door.

9. The waste receptacle of claim 8 wherein said housing includes a servicing door, said servicing door being movable to an open position to permit said bin to be emptied.

10. The waste receptacle of claim 1 wherein said waste receptacle has a compaction unit mounted within said housing to compress refuse accumulated therein.

11. The waste receptacle of claim 1 wherein said waste receptacle is free of compaction units.

12. The waste receptacle of claim 1, wherein said housing includes a servicing door by which a refuse bin can be stationed in said space to receive refuse introduced through said access door.

13. The waste receptacle of claim 1 wherein said receptacle includes at least one refuse sensor, said sensor being operable to gauge the quantity of accumulated refuse, said controller being operable to monitor said refuse sensor.

14. The waste receptacle of claim 13 wherein said at least one refuse monitoring sensor includes at least one sensor chosen from the set of sensors consisting of (a) a weight sensor; and (b) a level sensor operable to gauge refuse accumulated on a volumetric basis.

15. The waste receptacle of claim 14 wherein said at least one refuse monitoring sensor includes at least one weight sensor and at least one level sensor.
16. The waste receptacle of claim 15 further comprising a compaction unit operatively connected to said controller, said controller being operable to cause said compaction unit to compress the accumulated refuse in response to a signal from said level sensor.
17. The waste receptacle of claim 1 wherein said controller is in communication with a remote communication apparatus, and said controller and said remote communication apparatus are co-operable to permit staff to be notified remotely of a full condition of said receptacle.
18. The waste receptacle of claim 17 wherein said remote communication apparatus includes at least one telephonic communication element.
19. The waste receptacle of claim 18 wherein said at least one telephonic communication element is chosen from the set of telephonic communications elements consisting of (a) a cell phone; and (b) a beeper.
20. The waste receptacle of claim 17 wherein said receptacle is one member of an array of at least two receptacles in communication with said remote receiving apparatus.
21. The waste receptacle of claim 20 wherein at least one of said at least two receptacles includes a refuse compaction unit.
22. The waste receptacle of claim 20 wherein at least one of said at least two waste receptacles is free of refuse compaction units.
23. A waste receptacle system comprising:
  - a housing having a space defined therein in which refuse can be accumulated;
  - an access door mounted to said housing, said access door being movable to an open position to permit refuse to be introduced into said space;
  - a sensor mounted to detect the presence of accumulated refuse, said sensor being operable to indicate when the accumulated refuse has reached a full condition;
  - a control system operable to monitor said sensor; and

- said control system being operable to signal said full condition to a person remote from said housing.
24. A waste receptacle array system, comprising:
- at least a first waste receptacle, a second waste receptacle, and a remote communication device located away from said first and second receptacles;
  - said first waste receptacle having,
    - a housing having a space defined therein in which refuse can be accumulated;
    - an access door mounted to said housing, said access door being movable to an open position to permit refuse to be introduced into said space;
    - a sensor mounted to detect the presence of accumulated refuse, said sensor being operable to indicate when the accumulated refuse has reached a full condition;
    - a control system operable to monitor said sensor; and
    - said control system being operable to signal said full condition to said remote communication device located away from said housing;
  - said second waste receptacle having,
    - a housing having a space defined therein in which refuse can be accumulated;
    - an access door mounted to said housing, said access door being movable to an open position to permit refuse to be introduced into said space;
    - a sensor mounted to detect the presence of accumulated refuse, said sensor being operable to indicate when the accumulated refuse has reached a full condition;
    - a control system operable to monitor said sensor; and
    - said control system being operable to signal said full condition to said remote communication device;
25. The waste receptacle of claim 24 wherein said remote communication device is operable to notify staff of a full condition any of said first and said second receptacles.
26. The waste receptacle of claim 2 wherein said remote communication device includes at least one telephonic communication element.

27. The waste receptacle of claim 26 wherein said at least one telephonic communication element is chosen from the set of telephonic communications elements consisting of (a) a cell phone; and (b) a beeper.

28. The waste receptacle of claim 24 wherein at least one of said at least two receptacles includes a refuse compaction unit.

29. The waste receptacle of claim 24 wherein at least one of said at least two waste receptacles is free of refuse compaction units.

30. A waste receptacle comprising:  
a housing having a space defined therein in which a quantity of refuse can be accumulated;  
an access door mounted to said housing, said access door being movable to an open position to permit refuse to be introduced into the space;  
an actuator operable to move said access door to said open position;  
a controller connected to said actuator, said controller governing operation of said actuator;  
a sensor mounted to detect the presence of patrons adjacent to said access door;  
said controller being operable to monitor said sensor;  
said sensor having a first sensor element and a second sensor element;  
said first sensor element being positioned to observe a first approach envelope relative to said access door;  
said second sensor element being positioned to observe a second approach envelope relative to said access door; and  
said first approach envelope and said second approach envelope taken together cover a total approach envelope greater than said first range alone, and greater than said second range alone.

31. The waste receptacle of claim 30 wherein said proximity sensor has a plurality of illumination elements, said plurality of illumination elements being co-operable to cover all of said first approach envelope.

32. The waste receptacle of claim 31 wherein said plurality of illumination elements includes at least a first illumination element oriented to cover at least a first portion of said first approach envelope of said first sensing element, and a second illumination

element oriented to cover at least a second portion of said first approach envelope, said first and second portions overlapping each other.

33. The waste receptacle of claim 30 wherein said first sensing element and said second sensing element are mounted on a common base, and are spaced apart from each other on said base.

34. The waste receptacle of claim 30 wherein:  
said first sensing element and said second sensing element are mounted to a common base;  
said first sensing element is oriented at a first angle relative to said base; and  
said second element is oriented at a different angle relative to said base.

35. The waste receptacle of claim 30 wherein said sensor has a base, and a vertical plane of symmetry of said base extends normal to said base away from said waste receptacle, and said first approach envelope lies at least predominantly to one side of said plane, and said second approach envelope lies predominantly to the other side of said plane.

36. The waste receptacle of claim 30 wherein said first and second approach envelopes overlap.

37. The waste receptacle of claim 30 wherein said sensor includes at least two illumination elements placed to co-operate with said first sensing element.

38. The receptacle of claim 30 wherein each of said first and second approach envelopes is illuminated, at least in part, by more than one illumination element.

39. The receptacle of claim 30 wherein said sensor is an infra red proximity sensor.

40. The receptacle of claim 30 wherein said sensor includes infra red light emitting diodes and said first and second approach envelopes are illuminated by said light emitting diodes.

41. A waste receptacle comprising:  
a housing having a space defined therein in which refuse can be accumulated;

said housing having a first panel, said first panel having an opening formed therein through which refuse can be introduced into the space;  
an access door mounted to said first panel, said access door being movable to an open position to permit refuse to be introduced into said space;  
said housing and said access door mating along respective straight edges and being joined by a hinge running parallel to said straight edges;  
said panel having a first inner face and a first outer face;  
said access door having a second inner face and a second outer face;  
said hinge having first and second wings mounted to said first and second inner faces of said panel and said door respectively;  
said hinge having a hinge pin;  
each of said first and second hinge pins having tabs bent about said pin;  
said hinge pin being mounted adjacent to said first and second outer faces of said panel and said access door respectively.

42. The waste receptacle of claim 41 wherein said tabs are formed on a circular arc to engage said pin, and said tabs have an outer radius, said first and second outer surfaces lie in a plane when said access door is closed; and said tabs lie tangent to said plane.
43. The waste receptacle of claim 41 wherein at least one of (a) said panel and (b) said access door, is inwardly relieved to accommodate pivoting motion of said access door about said hinge to an open position.
44. The waste receptacle of claim 41 wherein at least one of (a) said panel, and (b) said access door, is chamfered to accommodate opening motion of said door relative to said panel.
45. The waste receptacle of claim 41 wherein at least one of (a) said first wing and (b) said second wing of said hinge has a proximal portion adjacent said hinge and a distal portion lying away from said hinge, said proximal portion being joined to said distal portion at a bend.
46. The waste receptacle of claim 45 wherein said bend is a dog leg formed to seat said first proximal portion and said distal portion about a chamfer.

47. The waste receptacle of claim 41 wherein said hinge is a continuous hinge extending along the majority of the length of the respective straight edges.
48. The waste receptacle of claim 41 wherein the hinge pin has a pivot axis and said axis lies closer to said outer face of said panel than to said inner face.
49. The waste receptacle of claim 41 wherein, in said closed position of said door said proximal portion of said first wing and said proximal portion of said second wing are oriented at an acute included angle  $[\alpha]$  from each other, and as said access door is moved to an open position said included angle diminishes.
50. The waste receptacle of claim 41 wherein, in said closed position of said access door, said proximal portion of said first wing of said hinge lies in a first plane, said proximal portion of said second wing lies in a second plane, said first and second planes intersecting along a line of intersection, said hinge pin having a pivot axis, and, said line of intersection lies further from said inner face of said first panel than said hinge pin axis.
51. The waste receptacle of claim 41 wherein said line of intersection of said first and second planes moves further away from said hinge pin axis as said access door is opened.